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L-tyrosine and L-dihydroxyphenylalanine as hormone-like regulators of melanocyte functions.

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Source

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Abstract

There is evidence that L-tyrosine and L-dihydroxyphenylalanine (L-DOPA), besides serving as substrates and intermediates of melanogenesis, are also bioregulatory agents acting not only as inducers and positive regulators of melanogenesis but also as regulators of other cellular functions. These can be mediated through action on specific receptors or through non-receptor-mediated mechanisms. The substrate induced (L-tyrosine and/or L-DOPA) melanogenic pathway would autoregulate itself as well as regulate the melanocyte functions through the activity of its structural or regulatory proteins and through intermediates of melanogenesis and melanin itself. Dissection of regulatory and autoregulatory elements of this process may elucidate how substrate-induced autoregulatory pathways have evolved from prokaryotic or simple eukaryotic organisms to complex systems in vertebrates. This could substantiate an older theory proposing that receptors for amino acid-derived hormones arose from the receptors for those amino acids, and that nuclear receptors evolved from primitive intracellular receptors binding nutritional factors or metabolic intermediates.

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